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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/086,305	03/01/2002	Eugene C. Ngai	MIT-105PUS	8565

22494 7590 08/06/2003

DALY, CROWLEY & MOFFORD, LLP  
SUITE 101  
275 TURNPIKE STREET  
CANTON, MA 02021-2310

EXAMINER

WIMER, MICHAEL C

ART UNIT

PAPER NUMBER

2821

DATE MAILED: 08/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application N .

10/086,305

Applicant(s)

NGAI ET AL. *EN*

Examiner

Michael C. Wimer

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-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 18 June 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7. 6) ☐ Other:

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "53" has been used to designate both "center pin" (page 6, line 29) and "axis" (page 9, line 12). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.
2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: Page 7, line 3, mentions coupling feature 63. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.
3. The drawings are objected to because the lead line for numeral 16b is missing in Fig. 1. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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5. Claims 9,15,17,19 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Haneishi (5124733).

Regarding Claims 9,15,17,19 and 21, Haneishi show in Figures 3 and 4, an antenna including a stacked patch assembly, each having a patch element 4 adapted to couple with an isolation structure to a second patch element 3 disposed on a surface of the substrate 1 and a ground plane 6 on the other side thereof, upper tuning structure 5a connected between the patches 3 and 4 and a lower tuning structure 5b connecting the second patch 3 to the ground plane 6, where the tuning structures are independently tuned and have different sizes (e.g., widths), an upper or lower feed 8 aligned with the tuning structures, all arranged as claimed.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 10-14,16,18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haneishi in view of Smith (4783661).

Regarding Claims 10-14, as noted above, Haneishi show the stacked patch elements. Smith is cited as showing an array of four stacked patch antennas to provide polarization diversity and separately fed upper and lower patches. The row of pins 15a may be a solid wall (col. 2, lines 45-55). It would have been

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obvious to the skilled artisan to employ a row of screws or pins in lieu of the solid wall in Haneishi according to the suggestion by Smith. Screws are an obvious substitute for conductive vias and pins as is well known in the microstrip antenna art. As to Claims 16, 18 and 20, separate feeds for the patches are shown in Smith feeding the four-patch array. It would have been obvious to the skilled artisan to pluralize the Haneishi antenna with respective feeders, according to the teachings of Smith.

8. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Haneishi in view of Ness (4697189).

Regarding Claim 22, Ness is cited as showing it to be well known to employ a ground plane 11 with a conductive sidewall 12. It would have been obvious to the skilled artisan to employ such a sidewall in the Haneishi antenna.

9. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Haneishi in view of Schneider et al (6218989).

Schneider et al are cited as showing it to be obvious to pluralize a basic patch antenna element, such as in Haneishi, into a four-square array. The feeders 11, 11a-d are taught to be connected to the electronics (col. 5, third paragraph), which include "combiner circuits" for providing circular polarization. It would have been obvious to pluralize the Haneishi antenna for circular polarization as taught by Schneider et al.

10. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schneider et al. in view of Marie et al (FR 2650442).

Regarding Claims 1-4, Schneider et al show in Fig. 1, an antenna comprising a substrate 6 with opposing surfaces that mount a plurality of patch antennas 9a-d and a ground plane 2, respectively, and at least one rectangularly-shaped surface wave control structure 15a disposed on the first (top) surface of the substrate 6, and between an adjacent pair of antenna elements. Marie et al are cited as resolving the level of ordinary skill in the antenna art and as evidence of obviousness and show a triangularly-shaped surface wave control structure 7, with a particular orientation angle with respect to the center of the antennas, disposed between antenna elements 2,3,4,5. It would have been obvious to the skilled artisan to employ the specific geometry of the structure 15a of Schneider et al as taught by Marie et al to be triangularly-shaped.

Regarding Claim 5, specific height and apex angle of the triangularly-shaped structure 7 in Marie et al are obvious design constraints dependent upon the amount of electric field to be suppressed. It would have been obvious to provide these particular measurements based upon those desired suppression values.

11. Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schneider et al in view of Marie et al as applied to claim 1 above, and further in view of Smith.

Regarding Claims 6-8, as noted above, Schneider et al and Marie et al have been discussed relative to the structures claimed. Providing a stacked patch array of microstrip antennas is shown by Smith. It would have been obvious to

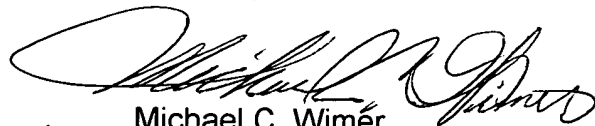
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the skilled artisan to employ a stacked antenna arrangement as sub-assemblies, along with the surface wave control structure in Schneider et al and Marie et al, for the purpose of providing a circularly polarized, dual-band antenna array.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael C. Wimer whose telephone number is (703) 305-3555. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don K. Wong can be reached on (703) 308-4856. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



Michael C. Wimer  
Primary Examiner  
Art Unit 2821

MCW

17 July 2003